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09/943,196	08/30/2001	Charles E. May	01-146	8500

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/943,196

Applicant(s)

MAY, CHARLES E.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 12-14 is/are rejected.
- 7) ☐ Claim(s) 9-11 and 15-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections – 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 2, 3, 4, 7, 8, 12, 13, and 14 rejected under 35 U.S.C. 102(a) as being anticipated by Ri et al. (English translation of JP 2001139935 A).

Ri teaches a method of fabricating a semiconductor wafer. The method comprises:

(a) polishing a semiconductor wafer with a polishing pad [0017, lines 11-13 and 17]; and

b) disposing a volume of a nonaqueous solvent (DMSO) onto said semiconductor wafer [0017, lines 11-13] and [0015, lines 1-6], as in claims 1 and 8; and

(a) subjecting a front side of said semiconductor wafer to chemical mechanical polishing [0008, lines 1-5]; and

b) disposing a volume of a nonaqueous solvent (DMSO) onto said front side of said semiconductor wafer [0017, lines 11-13]; [0015, lines 1-6]; and [0008, lines 1-5], as in claims 12 and 14.

Ri further teaches:

" . . . this invention relates to the chemical mechanical abrasive compound of the semiconductor device composed from the constituent for polish, the metallic-oxide

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impalpable powder which uses  $2O/SiO_2$  of aluminum complex as an indispensable component in more detail, deionized water, and the additive" [0001] and "... applying the constituent which made the abrasive material  $2O_3/SiO_2$  of aluminum complex as a slurry of the CMP process at the time of the semiconductor-device manufacture... They are OH, DMSO, etc, ... as other additives" [0014, lines 14-15], which reads on, disposing a volume of an aqueous slurry containing an abrasive material onto the semiconductor wafer, as claim 2;

polishing pad is in contact with said semiconductor wafer when said nonaqueous solvent is disposed onto said semiconductor wafer [0017, lines 11-17], as in claim 3;

preparing an  $Al_2O_3/SiO_2$  slurry in a polyethylene container [0017, lines 4-11] and adding various additives such as OH, DMSO, and  $NH_2$  to the polishing slurry [0015, lines 1-7], which reads on,

(c) mixing said aqueous slurry and said nonaqueous solvent in a mixing unit. Since Ri aqueous slurry and nonaqueous solvent is the same as that of the claimed invention, then using Ri's method of preparing a polishing slurry would inherently create an aqueous slurry/nonaqueous solvent mixture prior to being disposed onto said semiconductor wafer, as in claim 4;

said nonaqueous solvent includes an ammine, as in claims 7 and 13.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ri (JP '935 A) as applied to claim 1 above, and further in view of Kimura (US. 5,869,392)

Ri differs in failing to teach increasing the weight % of said nonaqueous solvent in said aqueous slurry/aqueous solvent mixture, in claims 5 and 6.

Kimura teaches in the CMP process, chemical polishing variables include the kind, pH, and composition of solvent; and mechanical polishing variables include the kind and concentration of slurry, the kind of polishing cloth, the pressure applied to abrasive, and the rotational speed of a carrier (wafer) (column 4, lines 11-16).

It is the examiner's position that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Ri by using and increasing Kimura's solvent composition because Kimura serves as evidence that the composition of a solvent serves as a so-called "result effective variable." It has been held that the discovery of an optimum value for result effective variables is within the purview of routine experimentation by the person of ordinary skill in the art. In re Boesch, 617 F.2d 272,276,205 USPQ 215, 219 (CCPA 1980).

### **Claim Objections**

5. Claims 9-11 and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

6. Applicant's arguments filed April 17, 2003 have been fully considered but they are not persuasive. Applicant traverses the 102(a) rejection of claims 1-4, 7, 8, and 12-14 as being anticipated by Ri et al. Applicant argues that Ri fails to disclose disposing of only a volume of the non-water dispersion medium during CMP, to the extent they are even similar, exactly as required by Applicant's claims. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., disposing only a volume of the non-water dispersion medium during CMP) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that claim 2 is not anticipated because it recites two disposing steps, one of a volume of an aqueous slurry, the other of a volume of a non aqueous solvent and that claims 7, 8, 13, and 14 are not anticipated by Ri for failing to disclose the inclusion of an ammine or dimethylsulfoxide as a nonaqueous solvent. Applicant's argument is unpersuasive because Ri teaches, ". . . this invention relates to the

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chemical mechanical abrasive compound of the semiconductor device composed from the constituent for polish, the metallic-oxide impalpable powder which uses  $2O/SiO_2$  of aluminum complex as an indispensable component in more detail, deionized water, and the additive" [0001], ". . . applying the constituent which made the abrasive material  $2O_3/SiO_2$  of aluminum complex as a slurry of the CMP process at the time of the semiconductor-device manufacture . . ." [0014, lines 14-15] and "various additives are added and used for the distributed liquid for polish . . . They are OH, DMSO, etc,  $Fe(NO_3)_2$  and  $NH_2$  – as other additives" [0014, lines 18-24], which supports disposing a volume of an aqueous slurry and a volume of a non aqueous solvent and the inclusion of DMSO and an ammine as a non aqueous solvent.

Applicant traverses the 103 rejection of claims 5 and 6 as being unpatentable over Ri in view of Kimura. Applicant argues the failure of the references to disclose a method of polishing in which the "weight % of said nonaqueous solvent in said aqueous slurry/nonaqueous solvent mixture" is increased "during said polishing" as in claim 5 and an endpoint for the increasing step disclosed in claim 5, as recited in claim 6. Applicant's argument is unpersuasive because Kimura is relied upon to teach Ri's deficiencies, increasing the weight % of said nonaqueous solvent in said aqueous slurry/aqueous solvent mixture, as in claims 5 and 6. Kimura teaches in the CMP process, chemical polishing variables include the kind, pH, and composition of solvent; and mechanical polishing variables include the kind and concentration of slurry, the kind of polishing cloth, the pressure applied to abrasive, and the rotational speed of a carrier (wafer) (column 4, lines 11-16). It is the examiner's position that it would have been

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obvious to one having ordinary skill in the art at the time of the claimed invention to modify Ri by using and increasing Kimura's solvent composition because Kimura serves as evidence that the composition of a solvent serves as a so-called "result effective variable." It has been held that the discovery of an optimum value for result effective variables is within the purview of routine experimentation by the person of ordinary skill in the art. In re Boesch, 617 F.2d 272,276,205 USPQ 215, 219 (CCPA 1980).

Last, applicant argues that Ri (published 5/22/2001) is not a valid prior art for the purpose of 102(a) and thus cannot be used to support rejections for either anticipation or obviousness. Applicant argument is unpersuasive because the 102(a) reference is based on,

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

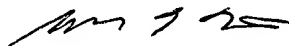
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-972-9310 for regular communications and 703-972-9311 for After Final communications.

ltue  
April 29, 2003



**BENJAMIN L. UTECH**  
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